

ANNEX E

INDUSTRIAL HEAD PROTECTION USER INFORMATION GUIDE

Hard Hats: Maintenance, Inspection, and Precautions

The hard hat is one of the most important pieces of equipment worn in the industrial workplace. Many workers have been saved from serious injury or even death because they were wearing a hard hat. To assist in your organization's head protection program, E.D. Bullard Company would like to share some observations on proper maintenance and inspection of industrial hard hats, as well as a few precautions. These comments apply to hard hats made by all manufacturers, not just Bullard.

A conventional hard hat consists of two components--the shell and the suspension--which work together as a system. Both components require periodic inspection and maintenance. It is recommended that employers conduct a regular head protection inspection, maintenance, and replacement program. Each program will vary according to the work environment at each job site location.

Hard Hat Shell

Thermoplastics (polyethylene, polycarbonate, and polyphthalate carbonate [P.P.C.][Lexan]) and thermoset materials (fiberglass and phenoli-impregnated textiles) are commonly used to mold the shells of industrial hard hats. These materials have proven to be durable, reliable, lightweight, and provide effective protection. Given proper care and normal workplace conditions, a hard hat will have a reasonable service life.

The shell should be inspected routinely for dents, cracks, nicks, gouges, and any damage due to impact, penetration, abrasions, rough treatment, or wear that might reduce the degree of protection originally provided. Any hard hat that shows signs of worn or damaged parts should be removed from service immediately and replaced.

Although Bullard adds an ultraviolet inhibitor to hard hat shells, all hard hats are susceptible to damage from ultraviolet light, temperature extremes, and chemical degradation. Thus, users who work in environments with high degrees of exposure to sunlight, heat, cold, or chemicals should replace their hard hats more frequently than workers in other environments.

Degradation of thermoplastic material may be apparent when the shell becomes stiff, brittle, faded, dull in color, or exhibits a chalky appearance. With further degradation the shell surface may craze, flake, or delaminate. A hard hat should be replaced immediately at the first sign of any of these conditions.

The following is a simple field test that can be performed by an employee or supervisor to determine possible degradation of polyethylene shells:

Compress the shell inward from the sides about 1" with both hands and then release the pressure without dropping the shell. The shell should quickly return to its original shape, exhibiting a degree of elasticity. Compare the elasticity of the sample with that of a new

shell. If the sample does not exhibit a similar degree of elasticity to that of a new shell or if it cracks due to embrittlement, it should be replaced immediately.

Hard Hat Suspension

The hard hat suspension system is just as important as the shell. Its main purpose is to help absorb the shock of a blow. Therefore, it must be in good condition at all times.

Like the shell, the suspension must also be inspected and replaced periodically. Over a period of time, the suspension will become worn and may become damaged.

Suspensions should be inspected closely for cracks, frayed or cut shell straps, torn headband or size adjustment slots, loss of pliability, or other signs of wear. These conditions can be caused by perspiration, hair oils, or normal wear.

Any suspension that is damaged must be removed from service and replaced immediately.

Cleaning

Hard hat service life can be extended by cleaning both the shell and the suspension. This should be part of the inspection and maintenance program. Scrub the shell and suspension with a mild detergent to remove dirt and stains. Rinse thoroughly with clean, warm water approximately 60 degrees Celsius (140 degrees Fahrenheit). After rinsing, wipe dry and carefully inspect once again for any signs of damage.

What is the Useful Life of a Hard Hat?

Users of industrial head protection devices must realize that these products do not have an indefinite useful life. E.D. Bullard Company recommends that employers conduct a regular head protection replacement program as a responsive solution to the task of addressing useful service life of hard hats.

Since the details of such a program must be developed based on work conditions at each job site, it is impossible to provide a specific timeframe for hard hat replacement. As a general guideline, many large corporations replace all employees' hard hats every five years, regardless of the hard hats' outward appearance.

Where user environments are known to include higher exposure to temperature extremes, sunlight or chemicals, hard hats should be replaced automatically after two years' use. This is based on information and hard hat samples returned to E.D. Bullard after being exposed to such conditions. It may be that in certain rare instances a hard hat should be replaced within less than two years.

The employer should have a policy of immediately replacing a hard hat if the employee (wearer) feels it is necessary.

WARNING: In addition to an inspection and maintenance program, employers should review with their employees some precautions concerning hard hat use and treatment. The following are some warnings that should be discussed:

- If the hard hat has been struck by a forcible blow of any magnitude, both the hard hat shell and suspension should be replaced immediately, even if no damage is visible.
- A conventional hard hat provides limited protection by reducing the force of falling objects striking the top of the shell. Protection from side impact and penetration is limited.
- The hard hat shell or suspension should never be altered or modified. Drilling holes in the shell for ventilation purposes must be prohibited at all times.
- Avoid contact of the hard hat with electrical wires.
- Hard hats should not be carried on the rear window shelf of an automobile or stored in direct sunlight. Exposure to extreme sunlight over time may cause degradation which can affect the degree of protection originally provided.
- Because hard hats can be damaged, they should not be abused. They should be kept free of abrasions, scrapes, and nicks and should not be dropped, thrown, or used as supports. Do not sit on a hard hat.
- Wearers should never carry or wear anything inside their hard hat. A clearance must be maintained between the shell and head for the protection system to work properly.
- Do not paint a hard hat prior to consultation with the manufacturer. Some paints and solvents may attack and damage the shell and reduce the degree of protection originally provided.
- As a general guideline, all new employees should be provided with a new, unused, and unexposed hard hat. The practice of reissuing cleaned hard hats must be avoided. The cost of a hard hat is negligible when the potential for injury, lost time, health care cost, and liability are considered.

**AMERICAN NATIONAL STANDARD FOR PERSONNEL PROTECTION
PROTECTIVE HEADWEAR FOR INDUSTRIAL WORKERS--REQUIREMENTS
ANSI Z89.1-1986**

Recommendations and Precautions Concerning Helmet Use, Maintenance, and Testing

B1. Laces

Laces, if any, should always be tied securely with a square knot.

B2. Cleaning

Shells should be scrubbed with a mild detergent and rinsed in clear water approximately 60 degrees Celsius (140 degrees Fahrenheit). After rinsing, the shell should be carefully inspected for any signs of damage.

Removal of tar, paints, oils, and other materials may require the use of a solvent. Since solvents may attack and damage the shell, the manufacturer should be consulted with regard to an acceptable solvent.

B3. Painting

Caution should be exercised if shells are to be painted, since some paints and thinners may attack and damage the shell and reduce protection. The manufacturer should be consulted with regard to paints or cleaning materials.

B4. Periodic Inspection

All components, shells, suspensions, headbands, sweat bands, and accessories, if any, should be visually inspected daily for signs of dents, cracks, penetration, and any damage due to impact, rough treatment, or wear that might reduce the degree of safety originally provided. Any industrial helmet that requires replacement or the replacement of any worn, damaged, or defective part should be removed from service until the condition of wear or damage has been corrected.

B5. Limitation of Protection

Industrial protective helmets meeting the requirements of ANSI Z89.1-1986 are designed to provide optimum protection under average conditions. Users are cautioned that if unusual conditions prevail (for example, higher or lower extremes of temperature than those prescribed), or if there are signs of abuse or mutilation of the helmet or of any component, the margin of safety may be reduced.

Note: All items constructed of polymeric materials are susceptible to damage from ultraviolet light and chemical degradation, and safety helmets are no exception. Periodic examination should be made of all safety helmets and in particular those worn or stored in areas exposed to sunlight for long periods. Ultraviolet degradation will first manifest itself in a loss of surface gloss, called chalking. Upon further degradation the surface will craze or flake away, or both. At the first appearance of either or both of the latter two phenomena, the shell should be replaced immediately for maximum safety.

B6. Sizes

Provisions should be made by the manufacturer of industrial protective helmets for testing large and small sizes as appropriate.

B7. Precautions

Because helmets can be damaged, they should not be abused. They should be kept free from abrasions, scrapes, and nicks and should not be dropped, thrown, or used as supports. This applies especially to helmets that are intended to afford protection against electrical hazards.

Industrial protective helmets should not be stored or carried on the rear-window shelf of an automobile, since sunlight and extreme heat may cause degradation that will adversely affect the degree of protection they provide. Also, in the case of an emergency stop or accident, the helmet might become a hazardous missile.

The addition of accessories to the helmet may adversely affect the original degree of protection. When precautions or limitations are indicated by the manufacturer, they should be transmitted to the wearer and care taken to see that such precautions and limitations are strictly observed.

B8. Safe Condition

Neither the impact resistance requirements (see 7.2) nor the electrical insulation requirement (see 7.1) should be construed to indicate the safe impact level or safe voltage to which the industrial worker may be subjected. The maximum voltage against which insulating safety headgear will protect the wearer depends on a number of variable factors, such as the characteristics of the electrical circuit and the equipment involved, the care exercised in maintenance of equipment, and weather conditions. Therefore, the safe and proper local use of insulating safety headgear is beyond the scope of ANSI Z89.1-1986.